

JUN 30 2004



1 / 3

AMSH1	THNEFTITHVIVP--KQSAGPDYCDMENVEELNVQDQHD--LLTLGWI[H][H]PTQTAFLS
AMSH2	THNEFTITHVIVP--KQSAGPDYCDMENVEELNVQDQHD--LLTLGWI[H][H]PTQTAFLS
AMSH	MRNEFTITHVLIP--KQSAGSDYCNTENEELFLIQQG--LITLGWI[H][H]PTQTAFLS
Rpn11	TVRIDVFAMPQS--GTGVSVAVDPVFQAKMLDKQTGRPEMVVGWY[H]SHPGFGCWLS
Jab1	TMIIMDSFALPVEGTETRVNAQAAAYEYMAAYIENAKQVGRLENAIGWY[H]SHPGGYGCWLS
	: : .. : : . * . . : ** [*:]* . : **
AMSH1	SVDLHTHCSYQLMLPEAIAIVCSPKHKDTG----IFRLTNAGMLEVSACKKGFH--PH
AMSH2	SVDLHTHCSYQLMLPEAIAIVCSPKHKDTG----IFRLTNAGMLEVSACKKGFH--PH
AMSH	SVDLHTHCSYQMLPESVAIVCSPKFQETG----FFKLTDHGLEEISSCRQKGFH--PH
Rpn11	GVDINTQQSFEALSERAVAVVVDPIQSVKGKVVIDAFRLINANMMVLGHEPRQTSNLGH
Jab1	GIDVSTQMLNQQFQEFPVAVVIDPTRTISAG---KVNLGAFRTYPKGYKPPDEGPSEYQ
	. : *: *: : : : *: * . * .. . *
AMSH1	TKEPRLFSICKHV--LVKDIKI-----IVLDLR-----
AMSH2	TKEPRLFSIQKFLSGIISGTAL-----EMEPLKIGYGPNGFPLLGISRSSSPSEQ
AMSH	SKDPPLFCSCSHVT--VVDRAV-----TITDLR-----
Rpn11	LNKPSIQALIHGLNRHYYSITINYRKNELEQKMLLNHKKSWMEGLTLQDYSEHCKHNES
Jab1	TIPLNKIEDFGVHCKQYYALEVSYFKSSLDRKLLELLWNKYWVNTLSSSSLTNADYTTG
	: : *
AMSH1	-----
AMSH2	L-----
AMSH	-----
Rpn11	VVKEMLELAKNYNKAVEEEEDKMTPEQLAIKNVKGQDPKRHLEEHVDVLMTSNIVQCLAAM
Jab1	QVFDLSEKLEQSEAQLGRGSFMLG--LETHDRKSEDKLAKATRDSCKTTIEAIHGLMSQV
AMSH1	-----
AMSH2	-----
AMSH	-----
Rpn11	LDTVVVFK-----
Jab1	IKDKLNFNQINIS

FIG. 1



APPLICANT(S): Lyapina et al.
 TITLE: REGULATION OF TARGET PROTEIN ACTIVITY
 THROUGH MODIFIER PROTEINS
 Application No.: 10/046,961 File Date: January 14, 2002
 Docket No.: CIT1510-3

2 / 3

AMSH1	-----MPDHTDVSLSPPEERVRALSKLCNITISEDITPRR	35
AMSH2	MDQPFTVNSLKKLAAMPDHTDVSLSPPEERVRALSKLCNITISEDITPRR	50
AMSH	-----MSDHGDVSLPPEDRVRALSQLGSAVEVNEDIPPRR	35
	. * * * . * * : * * * * * : * * . : : * * . * *	
AMSH1	YFRSGVEMERMASVYLEEGNLENANFVLYNKFITLFVKEKLPNHRDYQQCAV	85
AMSH2	YFRSGVEMERMASVYLEEGNLENANFVLYNKFITLFVKEKLPNHRDYQQCAV	100
AMSH	YFRSGVEIIRMASIYSEEGNIEHAFILYNKYITLFIEKLPKHRDYKSAVI	85
	* * * * * : * * * * : * * : * * * * : * * * * : * * * * : * * * * :	
AMSH1	PEKQDIMKKLKEIAFPRTDELKNLLKKYNVEYQEYLQSKNKGAEILKK	135
AMSH2	PEKQDIMKKLKEIAFPRTDELKNLLKKYNVEYQEYLQSKNKGAEILKK	150
AMSH	PEKKDTVKKLKEIAFPKAELKAELLKRYTKEYTEYNEEKKEAEELARN	135
	* * * : * : * * * * * * : * * * : * * : * * * : * * * : * * * : * :	
AMSH1	LEHQRLIEAERKRIAQMRRQQLESEQFLFFEDQLKKQELARGQMRSQTS	185
AMSH2	LEHQRLIEAERKRIAQMRRQQLESEQFLFFEDQLKKQELARGQMRSQTS	200
AMSH	MAIQQELEKEKQRVAQQKQQQLEQEKFHAFEEIMRNQELEKERLKIVQEF	185
	: * : * : * : * : * : * * * * . * * * * : * * * * : * * * * : * :	
AMSH1	G-LSEQIDGSALSCFS--THQNNSSLNVFADQPNKSDATNYASHSPPVNR	232
AMSH2	G-LSEQIDGSALSCFS--THQNNSSLNVFADQPNKSDATNYASHSPPVNR	247
AMSH	GKVDPGLGGPLVPDLEKPSLDVFPTLTVSSIQPSDCHTTVRAKPPVVDR	235
	* : . : . * : . : : . * . : * * . : * * * * : * : * : * : * :	
AMSH1	ALTPAATLSAVQNLVVEGLRCVVLPEDLCHKFLQLAESNTVRGIETCGIL	282
AMSH2	ALTPAATLSAVQNLVVEGLRCVVLPEDLCHKFLQLAESNTVRGIETCGIL	297
AMSH	SLKPGALSNSESIPTIDGLRHVVPGRLCPQFLQLASANTARGVETCGIL	285
	: * . * . : . : * : * * * * : * * * * : * * * * : * * * * : * * * * :	
AMSH1	CGKLTHNEFTITHVIVPKQSAGPDYCDMENVEELFNVQDQHDLTLGWIH	332
AMSH2	CGKLTHNEFTITHVIVPKQSAGPDYCDMENVEELFNVQDQHDLTLGWIH	347
AMSH	CGKLMRNEFTITHVLIPKQSAGSDYCNTEEEELFLIQDQQGLITLGWIH	335
	* * * * : * * * * * * * * : * * * * . * * * : * * * * : * * * : * : * * * * :	
AMSH1	THPTQTAFLSSVLDLHTCSYQLMLPEAIAIVCSPKHKDTGIFRLTNAGML	382
AMSH2	THPTQTAFLSSVLDLHTCSYQLMLPEAIAIVCSPKHKDTGIFRLTNAGML	397
AMSH	THPTQTAFLSSVLDLHTCSYQMLPESVAIVCSPKFQETGFFKLTGHL	385
	* * * * * * * * * * * * * * : * * * * : * * * * : * * * : * : * * * : * :	
AMSH1	EVSACKKKGFHPTHKEPRLFSICKHV--LVKDIKIIVLDL-----	421
AMSH2	EVSACKKKGFHPTHKEPRLFSIQKFLSGIISGTALEMEPLKIGYGPNGFP	447
AMSH	EISSCRQKGFHPHSKDPPLFCSCSHVT--VVDRAVTITDLR-----	424
	* : * : * : * * * * * : * * * . . : : . : : * :	
AMSH1	-----	
AMSH2	LLGISRSSSPSEQ 461	
AMSH	-----	

FIG. 2



APPLICANT(S): Lyapina et al.
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 THROUGH MODIFIER PROTEINS
 Application No.: 10/046,961 File Date: January 14, 2002
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3 / 3

COP9_su5_Hs	VGRLENAIGWYHSHPGYGCWLSGIDVSTQMLNQQFQEFPVA--VVVIDPTRTISAGKVN LG
COP9_su5_Dm	VGRMEHAVGWYHSHPGYGCWLSGINVSTQMLNQTYQEFPVA--IVVDPVRTVSAGKVCLG
COP9_su5_At	AGRLENVVGWYHSHPGYGCWLSGIDVSTQRLNQQHQEPFLA--VVVIDPTRT VSAGKVEIG
cop9_su5_Ce	EGRKEKVVVGWYHSHPGYGCWLSGIDVSTQTQNQKFQEFPWA--IVVIDPLRTMSAGKVDIG
AF2198_Arcfu	LPIGMKVFGTVHSHPSPSCRSEEDLSLFTRFGKYHIIVCY--PYDENSWKCYNRKGEEV
PH0451_Pyrho	MPHDESIKGTFHSHPSFPYPSEGDLMFFSKFGGIHIIIAAF--PYDEDSVKAFDSEGREV
TVN1035_Thevo	KPIDFSLVGSVHSHPSGITKPSDELRMFSLTGKIHIIVGY--PYNLKDYSAYDRSGNKV
MTH971_Metth	LPPFTGAVGSVHSHPGPVNLPSSAIDLHFFSKNGL FHLLIAH--PYTMETVAAYTRNGDPV
aq_1691_Aquae	ISKGMIEIVGVYHSHPDHPDRPSQFDLQR AFPDLSYIIFSVQ--KGKVASYRSWE LKGDKF
RV1334_Myctu	EDADEVVPVIYHSHTATEA YPSRTDVKLATEPD AHYVLVSTRDPHRHE LS RSYRIVDGAVT
RadC_Ecoli	IKINASALILAHNNHPSGCAEPSKADKLITERI IKSCQFMDL--RVLDHIVIGRGEYVSFA
.....HSHP.....S ' D

FIG. 3

COP9_su5_Hs	VGRLENAIGWYHSHPGYGCWLSGIDVSTQMLNQQFQEFPVA--VVVIDPTRTISAGKVN LG
COP9_su5_Dm	VGRMEHAVGWYHSHPGYGCWLSGINVSTQMLNQTYQEFPVA--IVVDPVRTVSAGKVCLG
COP9_su5_At	AGRLENVVGWYHSHPGYGCWLSGIDVSTQRLNQQHQEPFLA--VVVIDPTRT VSAGKVEIG
cop9_su5_Ce	EGRKEKVVVGWYHSHPGYGCWLSGIDVSTQTQNQKFQEFPWA--IVVIDPLRTMSAGKVDIG
Pad1_Dm	TGRPEMVVGWYHSHPGFGCWLSGV DINTQQSFEALSERAVA--VVVDPIQS VKG-KVVID
Pad1_Hs	TGRPEMVVGWYHSHPGFGCWLSGV DINTQQSFEALSERAVA--VVVDPIQS VKG-KVVID
Sks1_Dd	TGRDEIVIGWYHSHPGFGCWLSVDVNTQQSFEQLQSRAVA--VVVDPLQS VRG-KVVID
Pad1_Sc	TGRDQMVGWYHSHPGFGCWLSVDVNTQKSFEQLNSRAVA--VVVDPIQS VKG-KVVID
.....HSHP.....S ' D

FIG. 4